

# **MINK CREEK MOUNTAIN ESTATES (PWS 6030040) SOURCE WATER ASSESSMENT FINAL REPORT**

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**November 13, 2000**



## **State of Idaho Department of Environmental Quality**

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## Executive Summary

Under the Safe Drinking Water Act Amendments of 1996, all states are required by the U.S. Environmental Protection Agency to assess every source of public drinking water for its relative sensitivity to contaminants regulated by the act. This assessment is based on a land use inventory of the designated assessment area and sensitivity factors associated with the wells and aquifer characteristics.

This report, *Source Water Assessment for the Mink Creek Mountain Estates* describes the public drinking water system, the boundaries of the zones of water contribution, and the associated potential contaminant sources located within these boundaries. This assessment should be used as a planning tool, taken into account with local knowledge and concerns, to develop and implement appropriate protection measures for this source. **The results should not be used as an absolute measure of risk and they should not be used to undermine public confidence in the water system.**

The Mink Creek Mountain Estates water system consists of a single well source. Total coliform bacteria exceeded the Maximum Contaminant Level in the water sampling efforts of January 1995, June 1996, and June 2000. No potential contaminant sources exist within the delineation capture zones. The final susceptibility ranking for the well is low for inorganic contaminants, volatile and synthetic organic contaminants, and high for microbial contaminants.

For the Mink Creek Mountain Estates, source water protection activities should focus on implementation of practices aimed at keeping the distribution system free of microbial contaminants. Disinfection should be continued to reduce the risk of microbial contamination. Land uses within most of the source water assessment area are beyond the control of Mink Creek Mountain Estates. Therefore, partnerships with state and local agencies should be established to ensure future land uses are protective of ground water quality. Due to the time involved with the movement of ground water, source water protection activities should be aimed at long-term management strategies even though these strategies may not yield results in the near term.

This assessment should be used as a basis for determining appropriate new protection measures or re-evaluating existing protection efforts. No matter what ranking a source receives, protection is always important. Whether the source is currently located in a “pristine” area or an area with numerous industrial and/or agricultural land uses that require education and surveillance, the way to ensure good water quality in the future is to act now to protect valuable water supply resources.

A community with a fully developed source water protection program will incorporate many strategies. For assistance in developing protection strategies please contact Pocatello Regional Office of the Idaho Department of Environmental Quality or the Idaho Rural Water Association.

# **SOURCE WATER ASSESSMENT FOR MINK CREEK MOUNTAIN ESTATES, IDAHO**

## **Section 1. Introduction - Basis for Assessment**

The following sections contain information necessary to understand how and why this assessment was conducted. **It is important to review this information to understand what the ranking of this source means.** A map showing the delineated source water assessment area and the inventory of significant potential sources of contamination identified within that area are contained in this report. The list of significant potential contaminant source categories and their rankings used to develop this assessment is also attached.

### **Level of Accuracy and Purpose of the Assessment**

The Idaho Department of Environmental Quality (DEQ) is required by the U.S. Environmental Protection Agency (EPA) to assess the over 2,900 public drinking water sources in Idaho for their relative susceptibility to contaminants regulated by the Safe Drinking Water Act. This assessment is based on a land use inventory of the delineated assessment area, sensitivity factors associated with the wells, and aquifer characteristics. All assessments must be completed by May of 2003. The resources and time available to accomplish assessments are limited. Therefore, an in-depth, site-specific investigation to identify each significant potential source of contamination for every public water system is not possible. **This assessment should be used as a planning tool, taken into account with local knowledge and concerns, to develop and implement appropriate protection measures for this source. The results should not be used as an absolute measure of risk and they should not be used to undermine public confidence in the water system.**

The ultimate goal of the assessment is to provide data to local communities to develop a protection strategy for their drinking water supply system. DEQ recognizes that pollution prevention activities generally require less time and money to implement than treatment of a public water supply system once it has been contaminated. DEQ encourages communities to balance resource protection with economic growth and development. The decision as to the amount and types of information necessary to develop a source water protection program should be determined by the local community based on its own needs and limitations. Wellhead or source water protection is one facet of a comprehensive growth plan, and it can complement ongoing local planning efforts.

## **Section 2. Conducting the Assessment**

### **General Description of the Source Water Quality**

The Mink Creek Mountain Estates is a community public drinking water system serving approximately 35 persons. The water system is located south of the City of Pocatello in Bannock County (Figure 1). Residents receive their water from one artesian well source. Total coliform bacteria exceeded the Maximum Contaminant Level (MCL) in the water sampling efforts of January 1995, June 1996, and June 2000. At this time, there appears to be no primary water quality issues facing the water system.

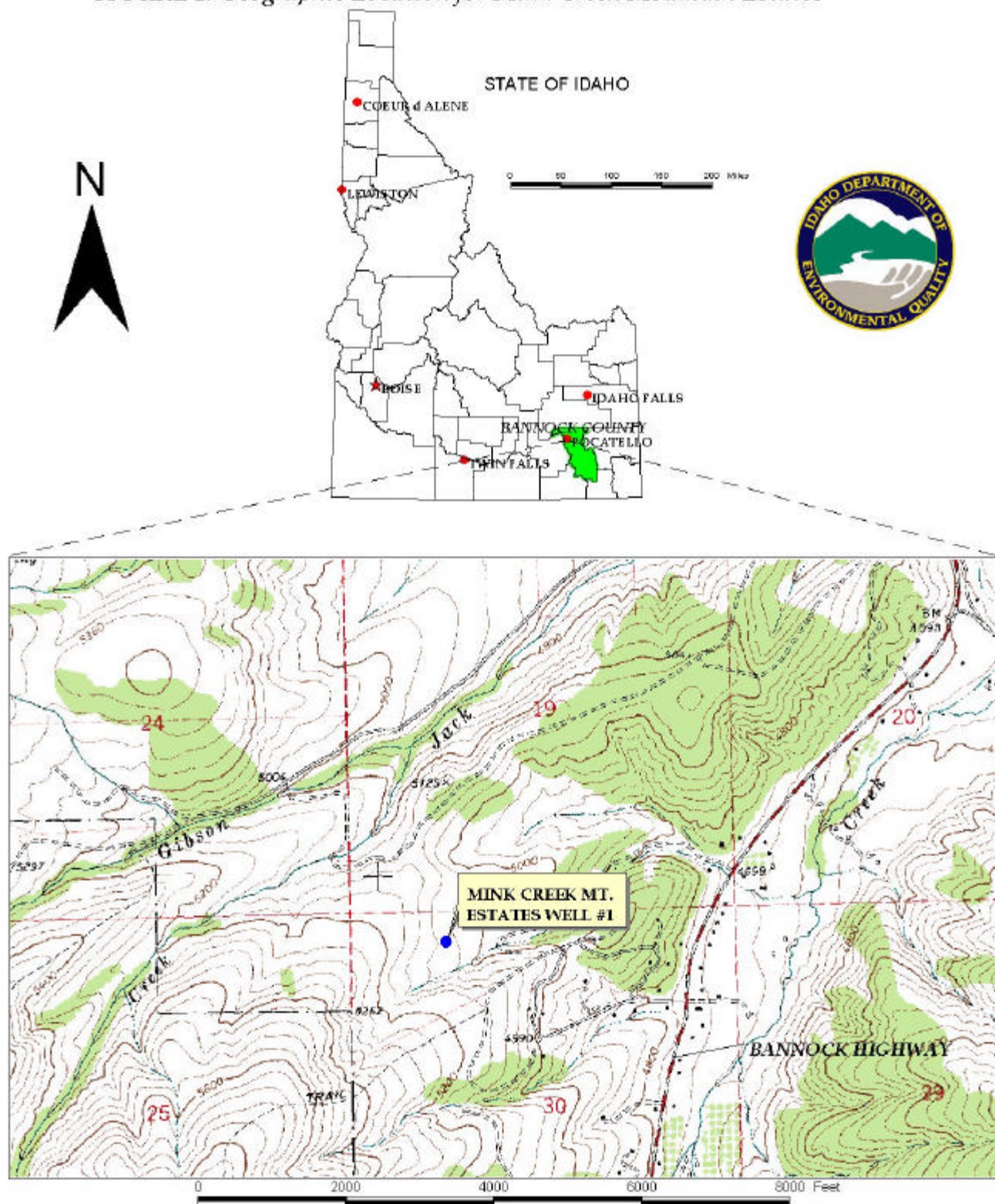
### **Defining the Zones of Contribution--Delineation**

The delineation process establishes the physical area around a well that will become the focal point of the assessment. The process includes mapping the boundaries of the zone of contribution into time of travel zones (zones indicating the number of years necessary for a particle of water to reach a pumping well) for water in the aquifer. Source water assessment process identifies three-year (Zone 1B), six-year (Zone 2), and ten-year (Zone 3) time-of-travel zones for each source. Because of insufficient well information the capture zones were delineated using a modified calculated fixed radius method. This method utilized assumed aquifer parameters (i.e. aquifer porosity) in combination with well specific information where available (i.e. well discharge rates and screen interval lengths). This information was used to calculate the radial time of travel distance for capture zone areas represented by fixed radii. Well-specific information was derived from a variety of sources including sanitary surveys, local well logs, and operator records. The actual data used by DEQ in determining the zone of contribution are available upon request.

### **Identifying Potential Sources of Contamination**

A potential source of contamination is defined as any facility or activity that stores, uses, or produces, as a product or by-product, the contaminants regulated under the Safe Drinking Water Act and has a sufficient likelihood of releasing such contaminants at levels that could pose a concern relative to drinking water sources. The goal of the inventory process is to locate and describe those facilities, land uses, and environmental conditions that are potential sources of ground water contamination. Field surveys conducted by DEQ and reviews of available databases did not identify potential sources of contamination within the delineation areas.

FIGURE 1. Geographic Location for Mink Creek Mountain Estates



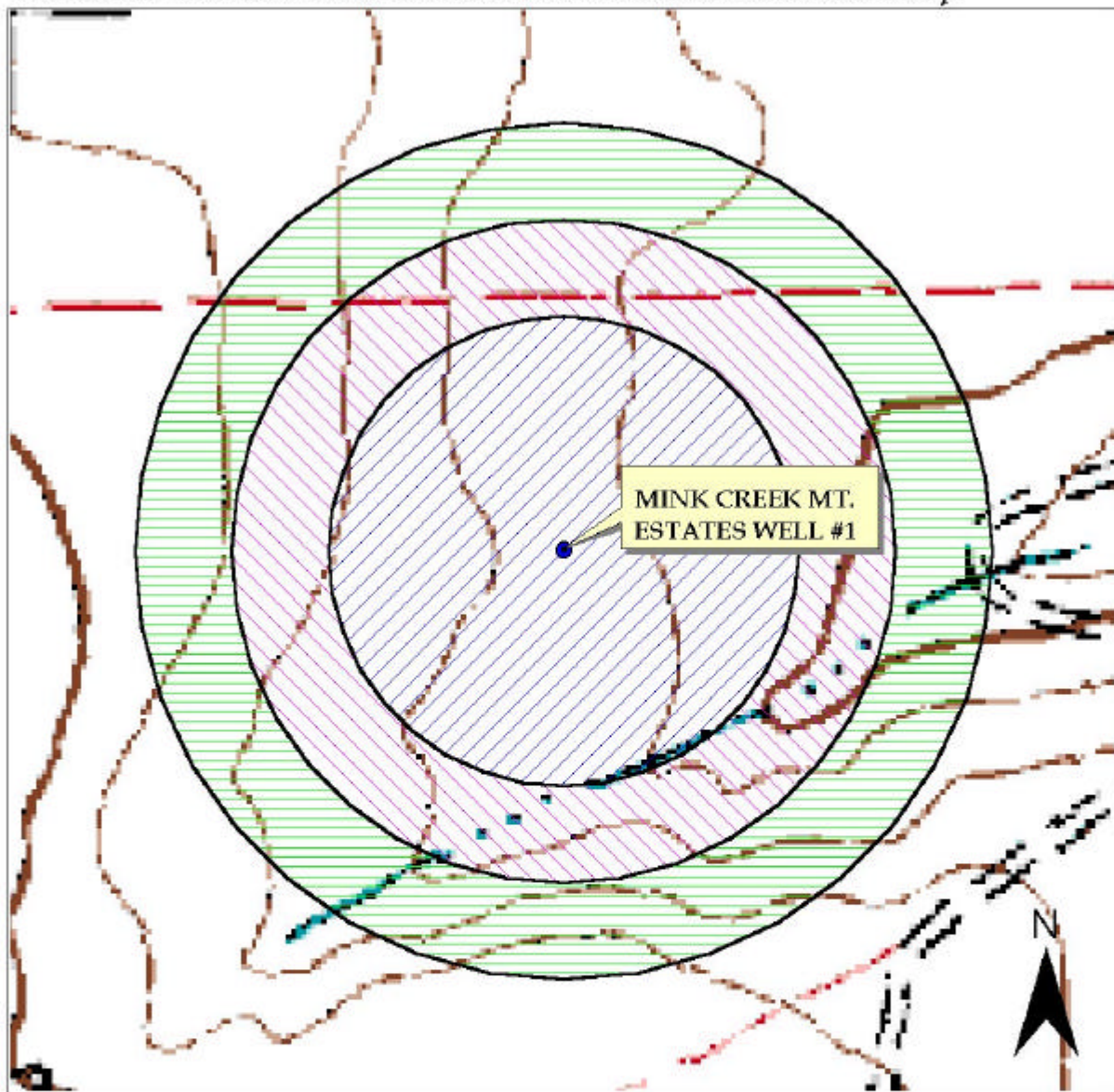
It is important to understand that a release may never occur from a potential source of contamination provided best management practices are used at the facility. Many potential sources of contamination are regulated at the federal level, state level, or both to reduce the risk of release. Therefore, when a business, facility, or property is identified as a potential contaminant source, this should not be interpreted to mean that this business, facility, or property is in violation of any local, state, or federal environmental law or regulation. What it does mean is that the potential for contamination exists due to the nature of the business, industry, or operation. There are a number of methods that water systems can use to work cooperatively with potential sources of contamination, such as educational visits and inspections of stored materials. Many owners of such facilities may not even be aware that they are located near a public water supply well.

### **Contaminant Source Inventory Process**

A contaminant inventory of the study area was conducted during the spring and summer of 2000. This involved identifying and documenting potential contaminant sources within the Mink Creek Mountain Estates Source Water Assessment Area through the use of computer databases and Geographic Information System (GIS) maps developed by DEQ. No potential contaminant sources were found within the delineated source water areas (Figure 2).



**FIGURE 2 - MINK CREEK MOUNTAIN ESTATES: Delineation Map**



**PWS# 6030040**  
**WELL #1**



### **Section 3. Susceptibility Analyses**

The susceptibility of the well to contamination was ranked as high, moderate, or low risk according to the following considerations: hydrologic characteristics, physical integrity of the well, land use characteristics, and potentially significant contaminant sources. The susceptibility rankings are specific to a particular potential contaminant or category of contaminants. Therefore, a high susceptibility rating relative to one potential contaminant does not mean that the water system is at the same risk for all other potential contaminants. The relative ranking that is derived for the well is a qualitative, screening-level step that, in many cases, uses generalized assumptions and best professional judgement. The following summaries describe the rationale for the susceptibility ranking.

#### **Hydrologic Sensitivity**

Hydrologic sensitivity was low for the well (see Table 2). The soils in the delineations are considered to be in the poor to moderate drainage class. The well log indicates five distinct clay layers (0-15 feet, 20-30 feet, 30-50 feet, 123-140 feet, and 140-145 feet) which could act as barriers and retard the vertical transport of contamination. The vadose zone (zone from land surface to the water table) is predominantly clay material.

#### **Well Construction**

Well construction directly affects the ability of the well to protect the aquifer from contaminants. System construction scores are reduced when information shows that potential contaminants will have a more difficult time reaching the intake of the well. Lower scores imply a system that can better protect the water. If the casing and annular seal both extend into a low permeability unit then the possibility of cross contamination from other aquifer layers is reduced and the system construction score goes down. If the highest production interval is more than 100 feet below the water table, then the system is considered to have better buffering capacity. When information was adequate, a determination was made as to whether the casing and annular seals extend into low permeability units and whether current public water system (PWS) construction standards are met.

The well construction rating is moderate for the well (Table 2). The well log shows the annular seal extends into a low permeable unit and the casing extends into permeable quartz boulders. A 1999 sanitary survey states that commercial grade chlorine should be used to disinfect rather than household bleach that is currently being used. The well is located outside the 100-year floodplain.

Information obtained from the well log is summarized in Table 1. Information gathered includes: 1) the depth of the well, 2) the casing diameter and depth, 3) water table depth, 4) screened or perforated intervals, 5) surface seal depth, 6) year of construction, and 7) whether current Idaho Department of Water Resources (IDWR) construction standards are being met.

**Table 1. Well Construction Characteristics of the Mink Creek Mountain Estates Well**

Well	Depth (ft)	Casing: diameter	Casing: depth	Water Table Depth (ft)	Screened Interval (ft)	Surface seal depth	Drill Year	IDWR Standards Met?
1	250	8-inch 6-inch	1-147 ft 140-240 ft	Artesian	150-155 200-220 230-240	50	1995	No

The well was given an additional point because it does not meet current well construction standards. The Idaho Department of Water Resources (IDWR) *Well Construction Standards Rules (1993)* require all public water systems (PWSs) to follow DEQ standards. IDAPA 58.01.08.550 requires that PWSs follow the *Recommended Standards for Water Works (1997)* during construction. Various aspects of the standards can be assessed from well logs. Table 1 of the *Recommended Standards for Water Works (1997)* states that 8-inch steel casing requires a thickness of 0.322 inches and 6-inch steel casing requires a thickness of 0.280. The well log indicates both the 8-inch and 6-inch steel casings have a thickness of 0.250. The standards state that screen will be installed and have openings based on sieve analysis of the formation. Standard 3.2.4.1 requires all PWSs to have yield and drawdown tests that last “24 hours or until stabilized drawdown has continued for six hours at 1.5 times the design pumping rate” (Recommended Standards for Water Works, 1997).

### Potential Contaminant Source and Land Use

The well rated low for inorganic chemicals (IOCs) (i.e. nitrate, barium, fluoride), synthetic organic chemicals (SOCs) (i.e. pesticides), volatile organic chemicals (VOCs) (i.e. petroleum products), and microbial contaminants. Total coliform bacteria exceeded the MCL in the water sampling efforts of January 1995, June 1996, and June 2000. The subdivision is located in mountainous terrain. The dominant land use in the delineated source water area is residential.

### Final Susceptibility Rating

A detection above a drinking water standard Maximum Contaminant Level (MCL), any detection of a VOC or SOC, or a detection of total coliform or fecal coliform will automatically give a high susceptibility rating to a well despite the land use of the area because a pathway for contamination already exists. In this case, the well rated high for microbial contaminants and low for IOC contaminants, VOC contaminants, and SOC contaminants.

**Table 2. Summary of Mink Creek Mountain Estates Susceptibility Evaluation**

	Susceptibility Scores									
	Hydrologic Sensitivity	Contaminant Inventory				System Construction	Final Susceptibility Ranking			
Well		IOC	VOC	SOC	Microbials		IOC	VOC	SOC	Microbials
1	L	L	L	L	L	M	L	L	L	H*

H = High Susceptibility, M = Moderate Susceptibility, L = Low Susceptibility; IOC = inorganic chemical  
VOC = volatile organic chemical, SOC = synthetic organic chemical; H\* - Indicates source automatically scored as high susceptibility due to presence of microbial contaminant above the MCL in the tested drinking water

## **Susceptibility Summary**

DEQ records indicate no detection of VOC or SOC contaminants in the drinking water. Mink Creek Mountain Estates is provided with good quality water from a confined artesian aquifer. No potential sources of contamination are present within the source water assessment area. The system has three total coliform bacteria MCL violations since 1995. These total coliform bacteria MCL violations account for the high rating in the final susceptibility ranking.

## **Section 4. Options for Source Water Protection**

The susceptibility assessment should be used as a basis for determining appropriate new protection measures or re-evaluating existing protection efforts. No matter what the susceptibility ranking a source receives, protection is always important. Whether the source is currently located in a “pristine” area or an area with numerous industrial and/or agricultural land uses that require education and surveillance, the way to ensure good water quality in the future is to act now to protect valuable water supply resources.

An effective source water protection program is tailored to the particular local source water protection area. A community with a fully developed source water protection program will incorporate many strategies. For the Mink Creek Mountain Estates, source water protection activities should focus on implementation of practices aimed at keeping the distribution system free of microbial contaminants. Disinfection should be continued to reduce the risk of microbial contamination. Land uses within most of the source water assessment area are beyond the control of Mink Creek Mountain Estates. Therefore, partnerships with state and local agencies should be established to ensure future land uses is protective of ground water quality. Any new businesses near the subdivision that employ potentially harmful chemicals should be monitored as well. Due to the time involved with the movement of ground water, wellhead protection activities should be aimed at long-term management strategies even though these strategies may not yield results in the near term.

## **Assistance**

Public water supplies and others may call the following DEQ offices with questions about this assessment and to request assistance with developing and implementing a local protection plan. In addition, draft protection plans may be submitted to the DEQ office for preliminary review and comments.

Pocatello Regional DEQ Office      (208) 236-6160

State DEQ Office      (208) 373-0502

Website: <http://www2.state.id.us/deq>

Water suppliers serving fewer than 10,000 persons may contact John Bokor, Idaho Rural Water Association, at 1-800-962-3257 for assistance with wellhead protection strategies.

## References Cited

Great Lakes-Upper Mississippi River Board of State and Provincial Public Health and Environment Managers, 1997. "Recommended Standards for Water Works."

Idaho Department of Environmental Quality. 1997. Design Standards for Public Drinking Water Systems. IDAPA 58.01.08.550.01.

Idaho Department of Water Resources, 1993. Administrative Rules of the Idaho Water Resource Board: Well Construction Standards Rules. IDAPA 37.03.09.

Southeastern District Health Department. 1999. *Mink Creek Mountain Estates Sanitary Survey Report*

Welhan, J. 2000. Idaho Geologic Survey. *SWA Capture Zone Delineations, Lower Portneuf and Marsh Valleys*

## POTENTIAL CONTAMINANT INVENTORY LIST OF ACRONYMS AND DEFINITIONS

**AST (Aboveground Storage Tanks)** – Sites with aboveground storage tanks.

**Business Mailing List** – This list contains potential contaminant sites identified through a yellow pages database search of standard industry codes (SIC).

**CERCLIS** – This includes sites considered for listing under the **Comprehensive Environmental Response Compensation and Liability Act (CERCLA)**. CERCLA, more commonly known as “Superfund” is designed to clean up hazardous waste sites that are on the national priority list (NPL).

**Cyanide Site** – DEQ permitted and known historical sites/facilities using cyanide.

**Dairy** – Sites included in the primary contaminant source inventory represent those facilities regulated by Idaho State Department of Agriculture (ISDA) and may range from a few head to several thousand head of milking cows.

**Deep Injection Well** – Injection wells regulated under the Idaho Department of Water Resources generally for the disposal of stormwater runoff or agricultural field drainage.

**Enhanced Inventory** – Enhanced inventory locations are potential contaminant source sites added by the water system. These can include new sites not captured during the primary contaminant inventory, or corrected locations for sites not properly located during the primary contaminant inventory. Enhanced inventory sites can also include miscellaneous sites added by the Idaho Department of Environmental Quality (IDEQ) during the primary contaminant inventory.

**Floodplain** – This is a coverage of the 100year floodplains.

**Group 1 Sites** – These are sites that show elevated levels of contaminants and are not within the priority one areas.

**Inorganic Priority Area** – Priority one areas where greater than 25% of the wells/springs show constituents higher than primary standards or other health standards.

**Landfill** – Areas of open and closed municipal and non-municipal landfills.

**LUST (Leaking Underground Storage Tank)** – Potential contaminant source sites associated with leaking underground storage tanks as regulated under RCRA.

**Mines and Quarries** – Mines and quarries permitted through the Idaho Department of Lands.)

**Nitrate Priority Area** – Area where greater than 25% of wells/springs show nitrate values above 5mg/l.

**NPDES (National Pollutant Discharge Elimination System)** – Sites with NPDES permits. The Clean Water Act requires that any discharge of a pollutant to waters of the United States from a point source must be authorized by an NPDES permit.

**Organic Priority Areas** – These are any areas where greater than 25 % of wells/springs show levels greater than 1% of the primary standard or other health standards.

**Recharge Point** – This includes active, proposed, and possible recharge sites on the Snake River Plain.

**RICRIS** – Site regulated under **Resource Conservation Recovery Act (RCRA)**. RCRA is commonly associated with the cradle to grave management approach for generation, storage, and disposal of hazardous wastes.

**SARA Tier II (Superfund Amendments and Reauthorization Act Tier II Facilities)** – These sites store certain types and amounts of hazardous materials and must be identified under the Community Right to Know Act.

**Toxic Release Inventory (TRI)** – The toxic release inventory list was developed as part of the Emergency Planning and Community Right to Know (Community Right to Know) Act passed in 1986. The Community Right to Know Act requires the reporting of any release of a chemical found on the TRI list.

**UST (Underground Storage Tank)** – Potential contaminant source sites associated with underground storage tanks regulated as regulated under RCRA.

**Wastewater Land Applications Sites** – These are areas where the land application of municipal or industrial wastewater is permitted by IDEQ.

**Wellheads** – These are drinking water well locations regulated under the Safe Drinking Water Act. They are not treated as potential contaminant sources.

**NOTE:** Many of the potential contaminant sources were located using a geocoding program where mailing addresses are used to locate a facility. Field verification of potential contaminant sources is an important element of an enhanced inventory.



## Attachment A

# Mink Creek Mountain Estates Susceptibility Analysis Worksheet

The final scores for the susceptibility analysis were determined using the following formulas:

- 1) VOC/SOC/IOC Final Score = Hydrologic Sensitivity + System Construction + (Potential Contaminant/Land Use x 0.2)
- 2) 2) Microbial Final Score = Hydrologic Sensitivity + System Construction + (Potential Contaminant/Land Use x 0.35)

Final Susceptibility Scoring:

0 - 5 Low Susceptibility

6 - 12 Moderate Susceptibility

≥ 13 High Susceptibility

1. System Construction		SCORE			
Drill Date	6/14/95				
Driller Log Available	YES				
Sanitary Survey (if yes, indicate date of last survey)	YES	1999			
Well meets IDWR construction standards	NO	1			
Wellhead and surface seal maintained	YES	0			
Casing and annular seal extend to low permeability unit	NO	2			
Highest production 100 feet below static water level	YES	0			
Well located outside the 100 year flood plain	YES	0			
Total System Construction Score		3			
2. Hydrologic Sensitivity					
Soils are poorly to moderately drained	YES	0			
Vadose zone composed of gravel, fractured rock or unknown	NO	0			
Depth to first water > 300 feet	NO	1			
Aquitard present with > 50 feet cumulative thickness	YES	0			
Total Hydrologic Score		1			
3. Potential Contaminant / Land Use - ZONE 1A		IOC Score	VOC Score	SOC Score	Microbial Score
Land Use Zone 1A	URBAN/COMMERCIAL	2	2	2	2
Farm chemical use high	NO	0	0	0	
IOC, VOC, SOC, or Microbial sources in Zone 1A	YES	NO	NO	NO	YES
Total Potential Contaminant Source/Land Use Score - Zone 1A		2	2	2	2
Potential Contaminant / Land Use - ZONE 1B					
Contaminant sources present (Number of Sources)	NO	0	0	0	0
(Score = # Sources X 2 ) 8 Points Maximum		0	0	0	0
Sources of Class II or III leacheable contaminants or	NO	0	0	0	
4 Points Maximum		0	0	0	
Zone 1B contains or intercepts a Group 1 Area	NO	0	0	0	0
Land use Zone 1B	Less Than 25% Agricultural Land	0	0	0	0
Total Potential Contaminant Source / Land Use Score - Zone 1B		0	0	0	0
Potential Contaminant / Land Use - ZONE II					
Contaminant Sources Present	NO	0	0	0	
Sources of Class II or III leacheable contaminants or	NO	0	0	0	
Land Use Zone II	Less than 25% Agricultural Land	0	0	0	
Potential Contaminant Source / Land Use Score - Zone II		0	0	0	0
Potential Contaminant / Land Use - ZONE III					
Contaminant Source Present	NO	0	0	0	
Sources of Class II or III leacheable contaminants or	NO	0	0	0	
Is there irrigated agricultural lands that occupy > 50% of	NO	0	0	0	
Total Potential Contaminant Source / Land Use Score - Zone III		0	0	0	0
Cumulative Potential Contaminant / Land Use Score		2	2	2	2
4. Final Susceptibility Source Score		4	4	4	5
5. Final Well Ranking		Low	Low	Low	High